

Calculation formula for photovoltaic welding bracket

What is a welded connection calculation?

The calculation is intended for the geometrical design and strength control of statically loaded welded connections of machine structures manufactured from carbon steels. The program enables you to design over 50 of the most common types of welded connections stressed by various combinations of load. The calculation deals with the following tasks:

How do you determine the shear resistance of a welded connection?

If the welding side is 12 mm, determine the shear resistance of the welded connection (see the connection example with the picture below). For steel grade S275, $v_w = 0.85$ (Table 4.1, BS EN 1993-1-1) Since the weld is done right round the perimeter of the pipe, the weld length $L = \pi d = \pi \cdot 150 = 471.24 \text{ mm}$

How do you calculate the load-bearing capacity of a weld?

With respect to the type of calculated stress, we can describe the conditions of the load-bearing capacity of the weld using the following relations: The required safety of the weld stress is then the ratio between the value of the yield strength of the basic material and the value of the maximum admissible stress of the specific weld.

Do welded parts need shape adjustment?

The welded parts do not need shape adjustment. For statically loaded connections, usually a flat weld is used, while a concave weld is more appropriate for dynamically loaded connections, as it has lower notch effects.

Why is a weld strength calculation not accurate?

The calculation does not consider the sudden formation of fragile fractures, change in material properties due to temperature, impact of own tensions or concentration of stress in the weld. An accurate theoretical solution to force and strength conditions is an extremely complicated problem for welded connections, even for welds with simple shapes.

What is a good thickness ratio for a weld?

The thickness ratio for individual parts should not exceed 1:3. The welds should be positioned towards the external force so that they are always only stressed in shear. Spot welds stressed in tension have significantly lower load-bearing capacity, which is why their use is not recommended. Lap welds can be made as single-shear or double-shear.

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